CHAPTER 8

MITIGATION DECISION ANALYSIS

8-1. Policy. Care must be taken to preserve and protect environmental resources, including unique and important ecological, aesthetic, and cultural values. The Fish and Wildlife Coordination Act of 1958 (Public law 85-624, 16 U.S.C. 61 et seq.) requires fish and wildlife mitigation measures when appropriate and justified. The National Historic Preservation Act of 1966 (Public Law 89-665, as amended, 16 U.S.C. 470 et seq.) does the same for cultural resources. The Water Resources Development Act of 1986 (Public Law 99-662) and implementing guidance provide further policy on fish and wildlife mitigation, including cost-sharing provisions. Specific Corps mitigation policy on fish and wildlife and historic and archaeological resources is included in ER 1105-2-50, Chapters 2 and 3, and current Engineering Circulars. All actions related to planning and implementing mitigation should incorporate appropriate Engineer Regulations and Engineer Circulars.

8-2. Definition.

a. Mitigation. The Council on Environmental Quality (CEQ), in its Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Part 1508.20), published a definition of mitigation that has been adopted by the Corps (ER 1105-2-50) and includes:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action.

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(5) Compensating for the impact by replacing or providing substitute resources or environments.

These will be referred to as the five elements of mitigation.

b. Significant Resources and Effects. Significance includes meanings of context and intensity. Context refers to the degree of technical, institutional, and/or public recognition accorded to a resource at local, regional, or national levels. Intensity refers to the severity of impacts as measured in duration, location, and magnitude of effects. The criteria for determining the significance of environmental resources and effects are provided in ER 1105-2-50, Appendix A, Section 1.7.3, and subsections 3.4.3, and 3.4.12. Significance of historic resources is further defined as a property listed or determined to be eligible for

listing in the National Register of Historic Places (ER 1105-2-50, Chapter 3).

8-3. Key Concepts for Mitigation.

a. General.

(1) Significant resources are to be identified and specifically considered in all phases of a project. If significant losses to those resources will occur because of the project or action, then those losses must be mitigated.

(2) Mitigation consists of avoiding, minimizing, rectifying, reducing, or compensating for the impacts. The five elements of mitigation are logically stepwise, i.e., it is better, easier, and often cheaper to avoid an impact than to compensate for it. The elements are iterative in that the results from one step may require reexamination of previous actions. The first elements of mitigation can often be accomplished through the use of good engineering practices, e.g., changes in project design.

(3) Impacts resulting from coastal shore protection projects are largely on coastal and Great Lakes bottoms, shorelines, wetlands, submerged aquatics, coral reefs, and other tropical and subtropical ecosystems. These areas will usually be composed of or are considered to be significant resources. Chapters 4-6 of this EM discuss potential impacts on some of these resources.

b. Early and Continuous Coordination and Public Involvement. Planning for mitigation must occur concurrently and proportionally with overall project planning activities and with the involvement of personnel from all appropriate state and Federal agencies (ER 1105-2-35). An integrated planning effort assures that the significant resources are correctly identified, significant impacts are determined, all the elements of mitigation are considered, and the mitigation actions taken or recommended are appropriate and justified.

c. Monetary and Nonmonetary Concerns. Both monetary and nonmonetary aspects of significant resources and effects will be considered. Monetary aspects are quantified using dollars, and nonmonetary aspects are quantified using one of several appropriate measures such as Habitat Units, acres, population data, Visual Impact Assessment Units, parts per million, and use-days.

d. Mitigation Framework. A useful framework for describing mitigation has two of four conditions:

(1) In kind - resources physically, biologically, and functionally the same or similar to those being altered.

(2) Out of kind - resources physically, biologically, and/or functionally dissimilar to those being altered.

(3) Onsite - occurring on, adjacent to, or in the immediate proximity of the impact.

(4) Offsite - occurring away from the site of the impact.

The first four elements of mitigation in paragraph 8-2a generally take place onsite, the fifth one may be onsite or offsite. Mitigation in kind and onsite requires no trade-offs, while the out of kind and offsite conditions show that relative values have been assigned.

e. Mitigation Objectives. Mitigation objectives should be stated as a quantification of the amount of compensation required for significant losses to significant resources. Both the identity and character of the significant resources and the amount of losses to them should be clearly documented. Significant resources should be placed in a priority list or category, accompanied by any stipulations such as the weightings to be used in trade-off analysis, trade-offs not allowed, or mitigation to be onsite.

f. Incremental Cost Analysis. Incremental or marginal cost analysis is a process used in designing a compensation plan that meets the mitigation objectives. It investigates and characterizes how the cost of a unit of output increases as the level of output changes, e.g., change in dollars per Habitat Unit with increasing Habitat Units. An analysis will result in an array of implementable mitigation actions, ranked from most to least cost-effective. A mitigation measure such as beach nourishment or placement of a sand fence becomes an increment when it is combined with other measures into a plan and analyzed to determine the most cost-effective solution.

g. Justification for Mitigation. Justification for mitigation must be based on the significance of the resource losses due to a project, compared to the costs necessary to carry out the mitigation (ER 1105-2-50, paragraph 2-4c(1)). Endangered and threatened species and designated critical habitats will be given special consideration (Public Law 93-205, as amended, 15 U.S.C. 1531-1543).

8-4. Examples. Throughout the text of this EM are measures that can serve one or more of the mitigation elements. Example measures of each of the elements are listed below:

a. Avoid -- Time construction activities to avoid periods of fish migration or shorebird nesting; preserve a public access point.

b. Minimize -- Disturb an immature reef instead of a mature one; use rough surface-facing materials on a structure.

c. Rectify -- Replace a berm; restore flow to former wetlands.

d. Reduce -- Control erosion; place restrictions on equipment and movement of construction and maintenance personnel.

e. Compensate -- Use dredged material to increase beach habitat; construct an artificial reef.